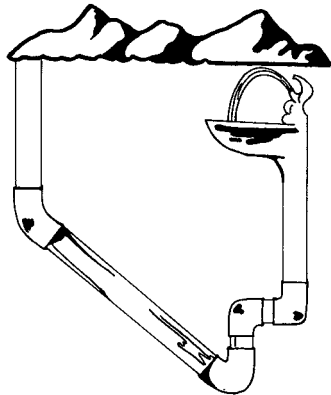


# Water Lines



**Water Lines** is the resource newsletter and calendar of the Nevada Drinking Water and Wastewater Training Coalition.

Volume 27 Winter 2007 Issue

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### Focus on Northern Nevada

Water Lines is funded by  
the Nevada Division of  
Environmental Protection

Editor, Brent Farr, P.E.

Editor, and Production, Joe Beard Jr.

## Featured Operator: David Wright of IHGID

By Dennis Longhofer, NTC Board

Dave Wright is the Water Operations Supervisor at Indian Hills General Improvement District. He has been with the District for 5 years.

*Featured  
Operator*

where the excess gas is pulled off the top and goes through the ozone destruct unit. Water is then chlorinated and pumped into the distribution system.

The Indian Hills GID serves a population of 6,500 customers with approximately 2,000 connections.

Indian Hills uses a 1.2 million gallon per day ozone treatment system where Dave was instrumental in the design review, and putting the system online.



*Dave Wright*

The ozone treatment plant has been in operation since 2005. The plant's treatment process consists of water being pumped from a 1,400 gallon per minute well, and then injected with ozone gas.

The water then goes through the ozone contact tank,

Some of Dave's other duties include performing water sampling for the District, helping with distribution maintenance, meter reading and customer relations. He also does all of the District's water reports to the State.

Dave is also currently involved with the District's research into an arsenic removal system. He has run three pilot tests on media treatment. And, he is now looking at a microfiltration treatment unit to determine its suitability.

Dave has both Grade III Water Treatment and Grade III Distribution operator certifications from the State of Nevada.

He has been in the water industry since 1977. He has worked for Kingsbury General Improvement District and for Douglas County.

He is very knowledgeable and self motivated. He is always looking for ways to improve the district's water operations.

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# Safety Zone: Workplace Fire Prevention and Protection Measures

By Stevan Palmer, RCAC

The best way for a water operator to protect against fire is to prevent one from happening in the first place, and the easiest way to prevent fires is to provide good housekeeping.

Keeping work areas clean, orderly, and free of cartons, crates, packing materials and other debris can greatly reduce fire hazards, as well as improve the appearance of utility buildings and grounds.

Providing metal containers with tightly fitting lids for oily rags can prevent fires caused by spontaneous combustion.

Operators should also take care to store gasoline, oil and flammable liquids well away from chlorine compounds and other strong oxidizers.

These types of housekeeping measures are low-cost ways to create a safer work environment.

Being trained in the proper use and maintenance of fire extinguishers is important for water operators to be able to minimize or prevent fire losses.

Do you know the location of every fire extinguisher in your work area?

Do you know which types of fire extinguishers are appropriate for different types of fires?

There are four basic classes of fires:

- **Class A** fires involve ordinary combustibles such as wood, paper, and dry vegetation.
- **Class B** fires involve flammable liquids and vapors, including gasoline, oil, paints and petroleum products
- **Class C** fires involve electrical equipment. Equipment should always be turned off before extinguishing this type of fire
- **Class D** fires are rare. They involve combustible metals such as magnesium, or zinc.

A good fire extinguisher to keep on hand will be effective for controlling two or more classes of fire. One commonly-used multi-purpose fire extinguisher is a dry chemical type. These extinguishers work well for class B and C fires, and also work on small class A fires.

Carbon dioxide extinguishers are good for Class C fires, and are also acceptable for Class A and B type fires.

Foam type extinguishers control Class A and B fires well. Water type extinguishers work well for Class A fires, but should never be used on other types of fires.

Halon extinguishers are preferred for Class C (electrical equipment) fires only.

Whatever type of extinguisher you have, it should be clearly labeled as to which types of fires

it will control. Read the labels on your fire extinguishers.

When fighting a fire with a hand held extinguisher, remember the acronym **P.A.S.S.** – **PULL**, **AIM**, **SQUEEZE**, and **SWEEP**. **PULL** the pin on the extinguisher handle, **AIM** the nozzle at the base of the fire. While standing about eight feet from the fire, **SQUEEZE** the handle to discharge the fire retardant, and **SWEEP** the nozzle back and forth at the base of the fire. When the fire appears to be out, watch carefully to assure it does not re-ignite.

Every type of fire extinguisher must be routinely inspected and maintained. Regular inspections should verify an extinguisher is available, fully charged, and in an operable condition.

Extinguisher maintenance should be performed at least annually, and include a thorough inspection, followed by repair of broken parts and replacement or regeneration of propellant or fire retardant chemicals if needed.

Maintenance of fire extinguishers should be only performed by a adequately trained person with proper equipment.

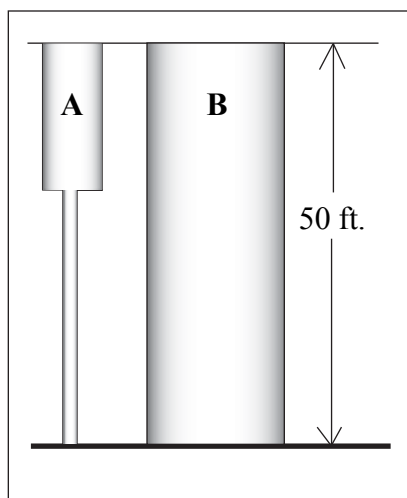
Records should be kept of all extinguisher inspections and service. Take some time to find out the types, locations and proper use of fire extinguishers in your work areas.

## The Spigot Q & A: Focus on Static Pressure



**Q 1.** Consider the two reservoirs below. Will the pressure at the bottom of each reservoir be:

- a. The same in both cases
- b. Greater in Tank A
- c. Greater in Tank B



### Answers to Spigot

Pressure is directly related to the height of a column of fluid. The height is called head or feet of head. For every foot of head, there is a pressure of 0.433 pounds per square inch (psi).

The pressure at the bottom of a container is **only** affected by the height of water in the container and **not** by the shape of the container. Therefore **a.** is the correct answer.

*Crystel Montecinos, Consultant, Tigren Inc., prepares The Spigot.*

## Featured Regulator: Dana Pennington

In October, Dana Pennington retired after thirty years with the State of Nevada. Between fishing and hunting trips, Dana recently sat down to talk with me about some of the changes he saw in the water program over the years and wants to recognize all of those who stand for progress in the industry.

It is rewarding to see how the Bureau staff has made the drinking water program in Nevada one of the best in the country. Credit for this success goes to the people who work together as teammates to make it happen - regulators, assistance providers, university professors, engineers and legislators, but especially the public water system operators (the hard-working, front-line defenders).

The water program started as a small group, first taking care of basics such as an inventory and classification of systems. The focus then was on the community systems, especially surface water systems, and dealing with the total coliform rule, turbidity standards, a limited number of regulated chemical contaminants and sanitary surveys. It took around five years to implement the basic program.

As new rules came along and the program requirements grew, staffing was built up. Additional training, funding, manpower and outreach to the regulated community was needed to round out the program, improve compliance and assure better distribution of safe drinking water.

A major landmark for Nevada was the implementation of operator certification. Professionalism among members of the drinking

water industry got a boost when the certification requirements came along. Wisely, lawmakers built in provisional certification, which allowed long-time operators to be certified for operation of their system after taking a course of study. Now, years later, there are only around thirty provisional operators at systems around the state.

In the late 1980's, much of the first operator training was being done by the Bureau, then technical assistance organizations gained momentum. On-site assistance and training, as well as state conferences, have fostered camaraderie in the industry. The Nevada Water and Wastewater Training Coalition was formed during this period, originally funded by Region 9 EPA and manned by helpful volunteers.

The State-funded grant program started, and later the State Revolving Fund program, enabling small communities to renovate and replace infrastructure. Aably managed by Adele Basham, the SRF not only funds projects, it also supports the regulatory program and capacity development work.

An invaluable consultant, Abby Johnson of RCAC, organized the Infrastructure for Nevada Communities (INC) group of loan and grant agencies and technical assistance providers. Along with anyone interested in helping water systems, INC continues to meet regularly to discuss and raise awareness of struggling systems. A videoconferencing-based training program was developed, sharing educational resources statewide.

People who work at diverse and

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## Featured System: Carson Colony Nitrate Treatment Facility

*By Bob Foerster, NvRWA*

As more and more treatment facilities are needed in Nevada to cope with arsenic, nitrate, uranium and other contaminants, we want to showcase new facilities. This will give current and future treatment operators, board members and others a chance to be thinking about their own projects.

The Carson Indian Community near Carson City serves drinking water to a population of approximately 250, through 92 metered connections. At one time, water was supplied from two wells and a spring. The spring produced around 30 gpm, but is not used due to high arsenic concentration. In recent years, nitrate has been increasing in the well water, exceeding the 10 ppm Maximum Contaminant Level in one source and approaching the limit in the other. As a result, the system is being equipped with an anion-exchange treatment facility. The system manager, Dave Tom of Washoe Utility Management Authority (WUMA), had to shut down the high-nitrate well until the facility could be completed. In addition, the community is now served by a wastewater collection system, with treatment at the Carson City facilities.

Dave Tom was Nevada Rural Water Association's Manager of the Year in 2006. He and three others operate four separate water systems. The

systems serve communities at Stewart, Carson Colony and Dresslerville in Nevada, and at Woodfords, California. All members of the WUMA operations staff are certified in both Treatment and Distribution, with most having earned Grade 2 Certificates. Given the number of water sources, population served, sodium hypochlorite disinfection, SCADA, and the treatment process, the new facility would be classified as a Grade 2 treatment facility.

Ion exchange is used to remove nitrate, a contaminant with acute health effects in susceptible populations. At Gerlach, this treatment technique (but using a cation exchange resin) is used to remove uranium (see the Spring 2007 issue of *Water Lines*). Ion exchange ("IX") is a well-established treatment technology for nitrate removal, so no pilot testing was necessary. The

process was designed by Jerry Lowry of Lowry Systems in Blue Hill Maine, and the project was managed by the Indian Health Service Reno office.

The IX capital project cost is \$614,000, including engineering and construction inspection. The major components are the IX skid cost at \$186,408 and the building and installation, another \$258,000. Funding sources include the Indian Health Service and a Housing and Urban Development CDBG grant. Process engineering was done by Lowry Engineering, a specialist in ion exchange treatment. Functionally, the water system will operate much as before, based on storage tank level. Water will be pumped alternately from the two, 140 gpm wells, with half passing through the treatment process and then blending with bypass water as it enters the distribution



## Featured System: Carson Colony *(Continued from page 4)*

system. After the process is launched in December 2007, the cost for operation of the treatment facility, including brine disposal and operation and maintenance, is projected to be \$5,500 per year.

The treatment process cycle can be divided into four phases: service, backwash, regeneration, and rinse. During the service (production) part of the process cycle, ion exchange works by substituting the undesired ion, nitrate ( $\text{NO}_3^{-2}$ ) for chloride ions ( $\text{Cl}^{-1}$ ) on the resin bead surfaces. Before all of the available sites on the beads are occupied by nitrate, regeneration is started. Resin capacity is limited and is a function of rate of flow, and the concentration of raw water nitrate, sulfate and other negative-charged ions (waterworks equation).

First the bed is taken out of service and backwashed to remove any solids accumulated and to expand the resin media. In regeneration, with the treatment process stopped, a brine ( $\text{NaCl}$ ) solution is pumped into the resin bed and allowed to soak. During regeneration, chloride from the brine displaces other ions and occupies sites on the beads. This effect is due to the ionic strength and gross amount of chloride in the brine. The nitrate and other negative ions released from the beads are removed when the brine is drained. The waste

brine is sent to a holding tank, followed by media rinse water. The resin bed is then ready to be placed in service, and the cycle starts over. The process-generated waste brine is to be collected in a holding tank, and then slowly drained into the sanitary sewer. Accepting this waste stream was part of the sewerage collection agreement between the Washoe Tribe and Carson City.

Upon completion of the project, well flow will be split in half, with approximately 70 gpm going through ion exchange, then blending back with the bypass portion. Ion exchange consumes some alkalinity, altering the water chemistry, and some pH adjustment is needed to maintain non-corrosive product water. Design features such as staggering

the regeneration cycles and splitting the flow should minimize the need for pH adjustment. The process will be automated, with operator attention needed every eight days to replenish brine and caustic soda vessels.

Concurrently, the WUMA systems are being outfitted with SCADA equipment, which will be monitored at a central facility. Sierra Controls of Carson City is supplying the SCADA systems. The IX skid will have four vessels, with three in service and one in standby ready for service when another goes into regeneration. Regeneration will occur every 574 bed volumes, and will require 4.82 bed volumes of product water.



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## Capacity Development Surveys

*By Farr West Engineering and NDEP*

Water supply systems face many challenges in achieving their goal of providing safe drinking water to their customers. Aging infrastructure, more stringent water standards, and the desire to keep water rates to a minimum are factors that water supply managers must resolve if they are to be successful.

The Nevada Division of Environmental Protection (NDEP) created the [Capacity Development Program](#) to help Public Water Systems (PWS) achieve and maintain compliance with State and Federal requirements. The Program has many components, but the centerpiece of the program is the Capacity Survey conducted at each water system. The information gathered from the Surveys is then compiled in an effort to prioritize Technical Assistance (TA) needs Statewide. Then, Technical Assistance providers are dispatched to help the water system make desired changes, and improvements to capacity.

NDEP has contracted with Farr West Engineering to conduct the Capacity Surveys. Participation in the survey is voluntary, unless the utility plans on applying for a State Revolving Fund loan. The State will **not** use the results of the survey for enforcement; instead the results of the survey will be used to offer free Technical Assistance. Farr West Engineering will contact each Public Water System to schedule an appointment for the survey. The interview process is easy, and requires about 1 hour to complete.

Many water systems throughout Nevada have increased their capacity through valuable Technical Assistance. Helping water systems develop and maintain capacity is the backbone of the Capacity Strategy. So, it is easy to understand why so much time and effort is spent on Technical Assistance. Assistance is prioritized based on need, and interest in the Program.

The State has been providing technical assistance to water systems for years, but there is still a great need for effective assistance, particularly in the financial and managerial areas. The goal of Technical Assistance is to make increases in capacity that will last long after the assistance provider is gone. Water systems need comprehensive solutions, and should also learn as much as possible from the experience.

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## New Nevada Operators Certified



These operators passed water certification exams for distribution and treatment grades 1, 2, 3 and 4. Congratulations to all !

### Distribution grades 1, 2, 3 and 4

**D-1:** Todd Abratowski, Ramiro Ballesteros, Ryan Barnes, Tiffany Bowling, Scott Carpenter, Daniel Hamilton, James Hendrickson, Elise Hoover, Thomas Larson, Mitchell McGlynn, David McGowan, Jerry Munk, Bradley Philpott, Steven Priscu, Anthony Riley, Garth Sinfield, Dave Smith, Robert Stephens, Jerome Stueve, William Templeton, Ted Turner, Stacey Van Diest, David Walton, Brian Wight

**D-2:** Ken Able, John Brotherson, Michael Crow, Gary Crumpacker, Brent Eisert, Gary Fields, Kyle Foss, Michael Johnson, Jeremy Lustig, Glen Morris, Wayne Romans, Richard Rosa, John Sheridan, Bradley Stevens, Jeffrey Todd, Thomas Vehe, Jeffery Voeltz

**D-3:** Steve Rippe, Stephen Volk

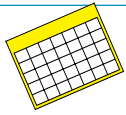
**D-4:** Kelli Burgess, Juan Esparza, Edward Fischer, Bill Hauck, Steven Henderson, Robert Kelley, Chris Melton, Antonio Mendive, Eric Mothershead, Walter Raymond, Scott Smiley

### Treatment grades 1, 2 and 4

**T-1:** Patricia Cannon, Joseph Davis, Thomas Gardner, Brian Greig, Blake Gudmundson, Kelly Hale, Daniel Higgins, Fred Hultenschmidt, Jeremy Lustig, Mitchell McGlynn, Bradley Philpott

**T-2:** Frank Felix, Kyle Foss, Dale Johnson, Guy Perry, Richard Rosa, Robert Seaver, Max Shen, Matthew Sunseri

**T-4:** Chris Erickson



# Training Calendar for 2008

**February 15** - Various locations - UNR Video conference. Topic: ISDE / Stage 2 Disinfection By-Products Rule. Info: Crystel Montecinos at 775/240-1396.💧

**March 7** - Various locations - UNR Video conference. Topic: Confined Spaces. Info: Crystel Montecinos at 775/240-1396.💧

**March 11-14** - Lake Tahoe - Nevada Rural Water Association Annual Training and Technical Conference, Harvey's Lake Tahoe. Look for registration materials in December. A limited number of scholarships are available. Contact NvRWA at 775/841-4222 or [nvrwa.org](http://nvrwa.org) for more information.💧

**April 18** - Various locations - UNR Video conference. Topic: Water Quality Analysis. Info: Crystel Montecinos at 775/240-1396.💧

**May 16** - Various locations - UNR Video conference. Topic: Math for Water Operators. Info: Crystel Montecinos at 775/240-1396.💧

**Ongoing** - On-site Training. Contact NvRWA at 775/841-4222 or [nvrwa.org](http://nvrwa.org) for more information.💧

💧 This symbol designates Nevada Division of Environmental Protection pre-approved training for certification renewal contact hours. Other training may be eligible but is not yet pre-approved. Before attending any training, verify approval by contacting NDEP at 775/687-9527. For renewal contact hours, a different ratio applies to Safety training. Generally, one Continuing Education Unit (CEU) is equivalent to ten training contact hours.

## Useful Training Contacts

### University of Nevada, Reno *Colleges of Agriculture, Biotechnology and Natural Resources & Cooperative Extension*

UNR videoconference classes for water system operators and managers are available in most communities. To request a workshop in your area, call Crystel Montecinos at 775/240-1396 or e-mail: [xtelle@aol.com](mailto:xtelle@aol.com).

### Community College of Southern Nevada *Wastewater & Water Technology Program*

Info: LeAnna Risso, 702/434-6600 ext. 6418.

### WWET Training in Clark County

Training for water treatment plant and distribution system operators, wastewater treatment plant and collection system operators, and other professionals working within these fields. Info: Jeff Butler 702/258-3296; see [www.wwet.org](http://www.wwet.org) for a current training calendar.

### State of Nevada Water Certification Exams

All exams will be proctored on the date listed. Applications and fees are due to the state (Steve Brockway) 45 days before exam dates. A proctor will contact examinees to schedule testing. Contact Geoff Daforno at 775/846-1885 for information about 2008 exam dates.

Water exams are scheduled quarterly at locations throughout the state. Info: 775/687-9527 or [http://ndep.nv.gov/bsdwc/cert\\_home.htm](http://ndep.nv.gov/bsdwc/cert_home.htm). Additional info: 775/465-2045 or [www.nvwea.org](http://www.nvwea.org).

### Nevada Rural Water Association

Please send requests for training through [nvrwa.org](http://nvrwa.org), or call 775/841-4222.

## Featured Regulator: Dana Pennington on Teamwork *(Continued from page 3)*

sometimes remote locations have begun to think of themselves as part of an industry, with a common mission. Operators, supported by layers of facilitators, have grown to be successful; and the people in Nevada's communities have benefited. Backed by US EPA and working as a team, the Bureau, the State Revolving Fund and Grant Program, the USDA and CDBG, all of the technical assistance providers, university professionals, and the engineering community have built a stable and effective program to supply safe drinking water. However, the work is not finished, and many challenges will confront this program in the future.

Starting off doing surveys on onion paper, with a typewriter hammering through the layers to make copies, the bureau is now using tablet notebook computers in the field to gather info about systems. While the technology has changed, three constants have kept the drinking water industry in Nevada successful: a dedication to thinking in terms of providing assistance, working as a team, and the recognition that, as one of Dana's mentors told him, 'we are all in the education business.' Dana has enjoyed a very rewarding career, and misses working with his friends at NDEP and all of the people involved in providing safe drinking water.

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# Nevada Drinking Water and Wastewater Training Coalition

**American Water Works Association  
California/Nevada Section**  
[www.ca-nv-awwa.org](http://www.ca-nv-awwa.org)  
909/291-2101

**Indian Health Service**  
*Dominic Wolf*, 775/784-5327  
**NDEP**  
<http://ndep.nv.gov/bwpc/bwpc01.htm>  
*Adele Basham*, DWSRF, 775/687-9488  
*Michelle Stamates*, AB 198 Water  
Grant Program, 775/687-9331  
*My-Linh Nguyen*, Wellhead Protection,  
775/687-9422

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*John Allred*  
*Curtis Duff*  
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*Andy Andersen*  
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*David Willard*

**Public Utilities Commission of Nevada**  
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775/687-9520  
*Jim Balderson*, SWAP, 687-9517  
*Steve Brockway*, CEU approval, 687-9527  
*Patty Lechler*, 687-9529  
*Bert Bellows*, arsenic, 687-9525

**Nevada Water Environment Association**  
[www.nvwea.org](http://www.nvwea.org)  
775/465-2045  
*Starlin Jones*, 775/861-4104  
*Eric Leveque*, 702/792-3711

**Rural Community Assistance Corporation**  
[www.rcac.org](http://www.rcac.org)  
775/323-8882  
*Stevan Palmer*, 775/750-1844

**U.S. Environmental Protection  
Agency, Region 9**  
[www.epa.gov/region09](http://www.epa.gov/region09)  
*Sara Jacobs*, 415/972-3564

**USDA Rural Development**  
[www.usda.gov/rus/water/index.htm](http://www.usda.gov/rus/water/index.htm)  
*Cheryl Couch*, 775/887-1222, ext. 22  
*Kay Vernatter*, 775/887-1222 ext. 28

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**UNR Colleges of Natural Resources  
and Environmental Science, and  
UNR Cooperative Extension**  
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*Mark Walker*, 775/784-1938  
**NDEP Board for Financing Water Projects**  
<http://ndep.nv.gov/bffwp/index.htm>  
**Water/Wastewater Education and Training  
Consortium of Southern Nevada — WWET**  
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*Water Lines*  
Winter 2007